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ARS 866 (2012) (English): Chickpeas –
Specification



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Chickpeas — Specification

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Table of contents

1	Scope	1
2	Normative references.....	1
3	Definitions	2
4	Quality requirements.....	3
4.1	General requirements	3
4.2	Specific requirements.....	4
5	Contaminants	4
5.1	Heavy metals	4
5.2	Pesticide residues.....	5
5.3	Mycotoxin limits.....	5
6	Hygiene	5
7	Packaging	5
8	Labelling.....	6
9	Sampling methods	6
	Bibliography	7

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Introduction

Chickpea is grown in tropical, sub-tropical and temperate regions. Chickpea makes up more than 20 percent of world pulse production, behind dry bean and pea. Kabuli type is grown in temperate regions while the Desi type chickpea is grown in the semi-arid tropics. Chickpea is consumed as a dry pulse crop or as a green vegetable with the former use being most common. Seeds average about 20% protein, 5% fat and 55% carbohydrate. Seeds are sold in markets either dry or canned. Chickpea seeds are eaten fresh as green vegetables, parched, fried, roasted, and boiled; as snack food, sweet and condiments; seeds are ground and the flour can be used as soup, dhal, and to make bread; prepared with pepper, salt and lemon it is served as a side dish. Dhal is the split chickpea without its seedcoat, dried and cooked into a thick soup or ground into flour for snacks and sweetmeats. Sprouted seeds are eaten as a vegetable or added to salads. Young plants and green pods are eaten like spinach. Animal feed is another use of chickpea in many countries. Gram husks, and green or dried stems and leaves are used for stock feed; whole seeds may be milled directly for feed. Chickpeas yield 21% starch suitable for textile sizing, giving a light finish to silk, wool, and cotton cloth.

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Chickpeas — Specification

1 Scope

This African Standard specifies requirements for methods of sampling and test for dry chickpeas of the varieties (cultivars) grown from *Cicer arietinum* Linn. intended for human consumption.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ARS 53, *General principles of food hygiene — Code of practice*

ARS 56, *Repackaged foods — Labelling*

AOAC Official Method 2001.04, *Determination of Fumonisins B₁ and B₂ in corn and corn flakes — Liquid chromatography with immunoaffinity column cleanup*

CODEX STAN 193, *Codex general standard for contaminants and toxins in food and feed*

ISO 520, *Cereals and pulses — Determination of the mass of 1000 grains*

ISO 605, *Pulses — Determination of impurities, size, foreign odours, insects, and species and variety — Test methods*

ISO 2164, *Pulses — Determination of glycosidic hydrocyanic acid*

ISO 2171, *Cereals, pulses and by-products — Determination of ash yield by incineration*

ISO 4112, *Cereals and pulses — Guidance on measurement of the temperature of grain stored in bulk*

ISO 4174, *Cereals, oilseeds and pulses — Measurement of unit pressure loss in one-dimensional air flow through bulk grain*

ISO 5223, *Test sieves for cereals*

ISO 5527, *Cereals — Vocabulary*

ISO 6322-1, *Storage of cereals and pulses — Part 1: General recommendations for the keeping of cereals*

ISO 6322-2, *Storage of cereals and pulses — Part 2: Practical recommendations*

ISO 6322-3, *Storage of cereals and pulses — Part 3: Control of attack by pests*

ISO 6639-1, *Cereals and pulses — Determination of hidden insect infestation — Part 1: General principles*

ISO 6639-2, *Cereals and pulses — Determination of hidden insect infestation — Part 2: Sampling*

ISO 6639-3, *Cereals and pulses — Determination of hidden insect infestation — Part 3: Reference method*

ISO 6639-4, *Cereals and pulses — Determination of hidden insect infestation — Part 4: Rapid methods*

ISO 6888-1, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) — Part 1: Technique using Baird-Parker agar medium*

ISO 6888-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) — Part 2: Technique using rabbit plasma fibrinogen agar medium*

ISO 6888-3, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coagulase-positive staphylococci (*Staphylococcus aureus* and other species) — Part 3: Detection and MPN technique for low numbers*

ISO 7251, *Microbiology of food and animal feeding stuffs — Horizontal method for the detection and enumeration of presumptive *Escherichia coli* — Most probable number technique*

ISO 13690, *Cereals, pulses and milled products — Sampling of static batches*

ISO 16002, *Stored cereal grains and pulses — Guidance on the detection of infestation by live invertebrates by trapping*

ISO 16050, *Foodstuffs — Determination of aflatoxin B₁, and the total content of aflatoxin B₁, B₂, G₁ and G₂ in cereals, nuts and derived products — High performance liquid chromatographic method*

ISO/TS 16634-2, *Food products — Determination of the total nitrogen content by combustion according to the Dumas principle and calculation of the crude protein content — Part 2: Cereals, pulses and milled cereal products*

ISO 20483, *Cereals and pulses — Determination of the nitrogen content and calculation of the crude protein content — Kjeldahl method*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

ISO 24557, *Pulses — Determination of moisture content — Air-oven method*

3 Definitions

For the purpose of this standard the following definitions apply.

3.1

chickpeas

dry mature seeds of *Cicer arietinum* L.

3.2

contaminated grain

grain containing any substance in sufficient quantity that the grain is unfit for consumption by persons or animals or is adulterated within the meaning of the regulations on food safety

3.3

damaged

whole or broken chickpeas that are sprouted, frost damaged, heated, damaged by insects, distinctly deteriorated or discoloured by weather or by disease, or that are otherwise damaged in a way that seriously affects their quality

3.4

mouldy chickpeas

chickpeas with visible mycelial growth on their surface

3.5**shriveled chickpeas**

chickpeas which are under-developed and wrinkled over their entire surface excluding wrinkled chickpeas

3.6**Spilt**

broken pieces of peas that are less than three-quarters of the whole seed, and cotyledons that are loosely held together by the seed coat

3.7**other coloured chickpeas**

chickpeas, which are of different colour from the dominant variety

3.8**foreign matter**

any extraneous matter than dry peas or other food grains comprising of

- (a) "inorganic matter" includes metallic pieces, shale, glass, dust, sand, gravel, stones, dirt, pebbles, lumps or earth, clay, mud and animal filth etc;
- (b) "organic matter" consisting of detached seed coats, straws, weeds and other inedible grains etc.

3.9**poisonous, toxic and/or harmful seeds**

any seed which if present in quantities above permissible limit may have damaging or dangerous effect on health, organoleptic properties or technological performance such as Jimson weed — dhatura (*D. fastuosa* Linn and *D. stramonium* Linn.) corn cokle (*Agrostemma githago* L., *Machai Lallium remulenum* Linn.) Akra (Vicia species), *Argemone mexicana*, Khesari and other seeds that are commonly recognized as harmful to health

4 Quality requirements

4.1 General requirements

Chickpeas shall meet the following general requirements/limits as determined using the relevant standards listed in Clause 2. Chickpeas

- a) shall be the dried mature grains of *Cicer arietinum* Linn
- b) shall be clean, well-filled, wholesome, uniform in size, shape, colour and in sound merchantable conditions;
- c) shall be free from substances which render them unfit for human or animal consumption or processing into or utilisation thereof as food or feed;
- d) shall be free from abnormal flavours, musty, sour or other undesirable odour, obnoxious smell and discolouration;
- e) shall be free of pests, live animals, animal carcasses, animal droppings, fungus infestation, added colouring matter, moulds, impurities of plant and animal origin including insects, rodent hair and excreta and shall meet any other sanitary and phytosanitary requirements;
- f) shall be free from micro-organisms and substances originating from micro-organisms, fungi or other poisonous or deleterious substances in amounts that may constitute a hazard to human health.
- g) shall be free from toxic or noxious seeds that are commonly recognized as harmful to health;

- h) shall contain no chemical residues which exceed the prescribed maximum residue limit;
- i) shall contain not more than 10 microgram per kilogram aflatoxin of which not more than 5 microgram per kilogram may be aflatoxin B1;

4.2 Specific requirements

4.2.1 Grading

Chickpeas may be graded into three grades on the basis of the tolerable limits established in Table 1 which shall be additional to the general requirements set out in this standard.

4.2.2 Ungraded chickpeas

Ungraded chickpeas shall be chickpeas which do not fall within the requirements of Grades 1, 2 and 3 of this standard but meet the minimum requirements provided in 4.1 and are not rejected chickpeas. Ungraded chickpeas can be sorted out to Grade 1, 2 or 3 in accordance with the relevant procedures.

4.2.3 Reject grade chickpeas

Reject chickpeas shall be peas which are musty, sour, heating, materially weathered, or weevily; which have any commercially objectionable odour; which contain insect webbing or filth, animal filth, any unknown foreign substance, broken glass, or metal fragments; or which are otherwise of distinctly low quality. The characteristics are not within the parameters specified in Table 1. They cannot satisfy the conditions of under grade chickpeas and shall be graded as reject chickpeas and shall be regarded as unfit for human or animal consumption.

Table 1 — Specific requirements

Characteristics	Maximum limits			Method of test
	Grade 1	Grade 2	Grade 3	
Foreign matter, % m/m	1.0	3.0	3.0	ISO 605
Inorganic matter, % m/m	0.1	0.5	0.70	
Broken grains, % m/m	1	2	3	
Pest damaged grains, % m/m	2	4	6	
Rotten and diseased grains, % m/m	0.5	0.5	1	
Discoloured grains, % m/m	2	2	2	
Immature/shrivelled grains, % m/m	3	5	8	
Filth, % m/m	0.1	0.1	0.1	
Total defective grains, % m/m	4.0	6.0	8.0	
Moisture, % m/m	14.0	14.0	14.0	ISO 24557
Total aflatoxin (AFB ₁ +AFB ₂ +AFG ₁ +AFG ₂), ppb, max	10			ISO 16050
Aflatoxin B1 only, ppb, max	5			
Fumonisin, ppm, max	2			AOAC 2001.04

5 Contaminants

5.1 Heavy metals

Chickpeas shall comply with those maximum limits for heavy metals established by the Codex Alimentarius Commission for this commodity.

5.2 Pesticide residues

Chickpeas shall comply with those maximum pesticide residue limits established by the Codex Alimentarius Commission for this commodity

5.3 Mycotoxin limits

Chickpeas shall comply with those maximum mycotoxin limits established by the Codex Alimentarius Commission for this commodity. In particular, total aflatoxin levels in chickpeas for human consumption shall not exceed 10 µg/kg (ppb) with B₁ not exceeding 5 µg/kg (ppb) when tested according to ISO 16050.

6 Hygiene

6.1 Chickpeas shall be produced, prepared and handled in accordance with the provisions of appropriate sections of ARS 53.

6.2 When tested by appropriate standards of sampling and examination listed in Clause 2, the products:

- shall be free from microorganisms in amounts which may represent a hazard to health and shall not exceed the limits stipulated in Table 2;
- shall be free from parasites which may represent a hazard to health; and
- shall not contain any substance originating from microorganisms in amounts which may represent a hazard to health.

Table 2 — Microbiological limits

	Type of micro-organism	Limits	Test method
i)	Yeasts and moulds, max. per g	10 ⁵	ISO 21527-2
ii)	<i>Staphylococcus aureus</i> per 25 g	Not detectable	ISO 6888
iii)	<i>E. Coli</i> , max. per g	Not detectable	ISO 7251
iv)	<i>Salmonella</i> , max. per 25 g	Not detectable	ISO 6579

7 Packaging

7.1 Chickpeas shall be packed in suitable packages which shall be clean, sound, free from insect, fungal infestation and the packing material shall be of food grade quality.

7.2 Chickpeas shall be packed in containers which will safeguard the hygienic, nutritional, technological and organoleptic qualities of the products.

7.3 The containers, including packaging material, shall be made of substances which are safe and suitable for their intended use. They shall not impart any toxic substance or undesirable odour or flavour to the product.

7.4 Each package shall contain chickpeas of the same type and of the same grade designation.

7.5 If chickpeas are presented in bags, the bags shall also be free of pests and contaminants.

7.6 Each package shall be securely closed and sealed.

8 Labelling

8.1 In addition to the requirements in ARS 56, each package shall be legibly and indelibly marked with the following:

- i) product name as “Chickpeas”;
- ii) variety;
- iii) grade;
- iv) name, address and physical location of the producer/ packer/importer;
- v) lot/batch/code number;
- vi) net weight, in kg;
- vii) the declaration “Food for Human Consumption”
- viii) storage instruction as “Store in a cool dry place away from any contaminants”;
- ix) crop year;
- x) packing date;
- xi) instructions on disposal of used package;
- xii) country of origin;
- xiii) a declaration on whether the chickpeas were genetically modified or not.

8.2 Labelling of non-retail containers

Information for non-retail containers shall either be given on the container or in accompanying documents, except that the name of the product, lot identification and the name and address of the manufacturer or packer shall appear on the container. However, lot identification and the name and address of the manufacturer or packer may be replaced by an identification mark, provided that such a mark is clearly identifiable with the accompanying documents.

9 Sampling methods

Sampling shall be done in accordance with the ISO 13690.

Bibliography

EAS 754:2011, *Chickpeas — Specification*

Chickpeas Official Grain Grading Guide, August 1, 2012, Canadian Grain Commission

Pulses Grading and Marking Rules, 2003, Schedule XII, *Grade designation and definition of quality of Kabuli Chana*, Ministry of Agriculture, India, 7th April 2004

Ethiopian Standards, ES 18:2001, *Pulses — Grading of chickpeas*

CODEX STAN 171:1989 (Rev. 1:1995), *Standard for Certain Pulses*

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